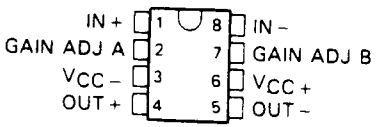
33451

TYPES TL592, TL592A
DIFFERENTIAL VIDEO AMPLIFIERS

D2668, NOVEMBER 1983

- **8-Pin Version of NE592 . . . Saves Printed Circuit Board Space**
- **Adjustable Gain to 400**
- **No Frequency Compensation Required**
- **Adjustable Passband**

P DUAL-IN-LINE PACKAGE
(TOP VIEW)



description

This device is a monolithic two-stage video amplifier with differential inputs and differential outputs.

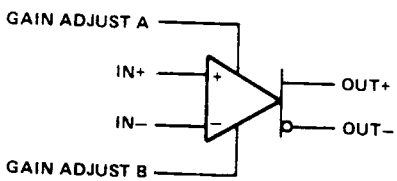
Internal series-shunt feedback provides wide bandwidth, low phase distortion, and excellent gain stability. Emitter-follower outputs enable the device to drive capacitive loads. All stages are current-source biased to obtain high common-mode and supply-voltage rejection ratios.

Fixed differential amplification of nominally 400 may be selected without external components, or amplification may be adjusted from 0 to approximately 400 by the use of a single external resistor connected between the gain-adjustment pins A and B. No external frequency-compensating components are required for any gain option.

The device is particularly useful in magnetic-tape or disc-file systems using phase or NRZ encoding and in high-speed thin-film or plated-wire memories. Other applications include general-purpose video and pulse amplifiers where wide bandwidth, low phase shift, and excellent gain stability are required.

The TL592 and TL592A are characterized for operation from 0°C to 70°C.

symbol



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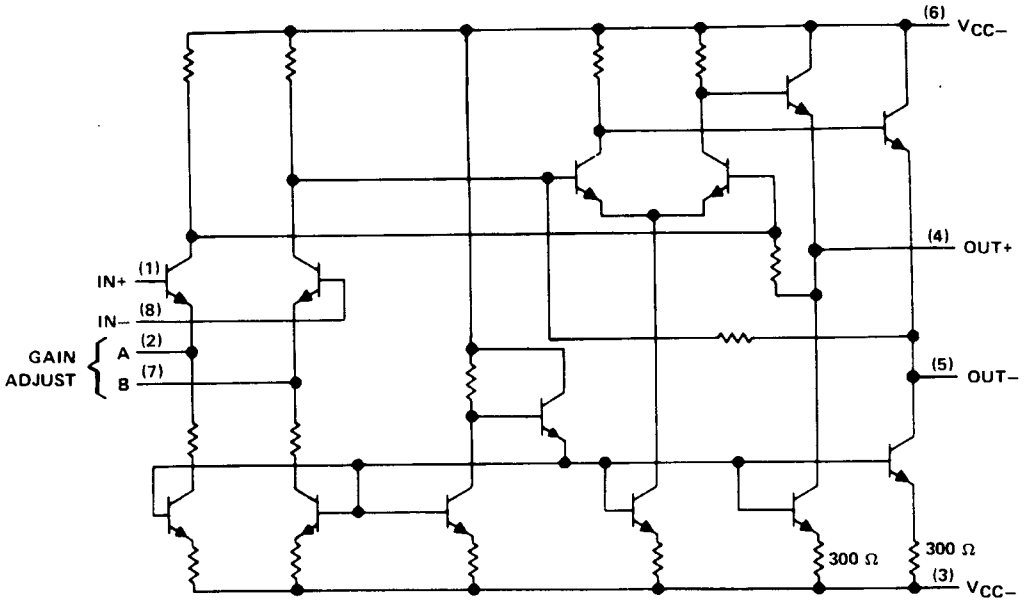
schematic



absolute maximum ratings over operating free-air temperature (unless otherwise noted)

Supply voltage, V_{CC+} (see Note 1) . . . . . 8 V
Supply voltage, V_{CC-} (see Note 1) . . . . . −8 V
Differential input voltage . . . . . ±5 V
Voltage range, any input . . . . . V_{CC+} to V_{CC-}
Output current . . . . . 10 mA
Continuous total power dissipation . . . . . 500 mW
Operating free-air temperature range . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . . 260°C

NOTE 1: All voltage values except differential input voltages are with respect to the midpoint between V_{CC+} and V_{CC-}.

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC+}	3	6	8	V
Supply voltage, V_{CC-}	−3	−6	−8	V
Operating free-air temperature, T_A	0		70	°C

electrical characteristics at specified free-air temperature, V_{CC+} = 6 V, V_{CC-} = −6 V, R_L = 2 kΩ (unless otherwise noted)

PARAMETER		TEST FIGURE	TEST CONDITIONS			GAIN OPTION†	TL592			TL592A			UNIT
							MIN	TYP	MAX	MIN	TYP	MAX	
A_{VD}	Large-signal differential voltage amplification	1	V_{OPP} = 3 V, R_L = 2 kΩ		25°C	1	250	400	600	400	440	600	V/V
					0°C to 70°C		250		600	400		600	
BW	Bandwidth (−3 dB)	2	V_{OPP} = 1 V		25°C	1		50			50		MHz
I_{IO}	Input offset current				25°C	1 or 2		0.4	5		0.4	5	μA
					0°C to 70°C				6			6	
I_{IB}	Input bias current				25°C	1 or 2		9	30		10	30	μA
					0°C to 70°C				40			40	
V_{ICR}	Common-mode input voltage range	3			25°C	1 or 2	±1			±1			V
					0°C to 70°C		±1			±1			
V_{OC}	Common-mode output voltage	1	R_L = ∞		25°C	1 or 2	2.4	2.9	3.4	2.4	2.9	3.4	V
V_{OO}	Output offset voltage	1	V_{ID} = 0, R_L = ∞		25°C	2		0.35	0.75		0.35	0.75	V
					0°C to 70°C				1.5			1.5	
V_{OPP}	Peak-to-peak output voltage swing	1	R_L = 2 kΩ		25°C	1	3	4		3	4		V
					0°C to 70°C		2.8			2.8			
z_i	Input impedance		V_{OD} = 1 V, f = 1 kHz to 10 MHz		25°C	1		4			3.6		kΩ
					0°C to 70°C			3.6			3.3		
CMRR	Common-mode rejection ratio	3	V_{IC} = ±1 V	f = 100 kHz	25°C	1	60	86		60	86		dB
				f = 5 MHz				60			60		
				f = 100 kHz	0°C to 70°C		50			50			
				f = 5 MHz				60			60		
k_{SVR}	Supply voltage rejection ratio ($\Delta V_{CC}/\Delta V_{IO}$)	4	ΔV_{CC+} = ±0.5 V, ΔV_{CC-} = ±0.5 V		25°C	1	50	70		50	70		dB
					0°C to 70°C		50			50			
V_n	Broadband equivalent input noise voltage	4	BW = 1 kHz to 10 MHz		25°C	1 or 2		12			12		μV
t_{pd}	Propagation delay time	2	ΔV_O = 1 V		25°C	2		7.5			7.5		ns
t_r	Rise time	2	ΔV_O = 1 V		25°C	2		10.5			10.5		ns
$I_{sink(max)}$	Maximum output sink current					1, 2, or 3	3	4		3	4		ma
I_{CC}	Supply current		No load, No signal		25°C	1 or 2		18	24		19	24	mA
					0°C to 70°C				27			27	

†The gain option is selected as follows:
Gain Option 1 . . . Gain adjust pin A is connected to pin B.
Gain Option 2 . . . Gain adjust pins A and B are open.

TYPE TL592B
DIFFERENTIAL VIDEO AMPLIFIER

D2668, OCTOBER 1983

- Adjustable Gain to 400
- No Frequency Compensation Required
- Adjustable Passband
- Lower Noise . . . Less than 3 μV

description

This device is a monolithic two-stage video amplifier with differential inputs and differential outputs. It features internal series-shunt feedback that provides wide bandwidth, low phase distortion, and excellent gain stability. Emitter-follower outputs enable the device to drive capacitive loads. All stages are current-source biased to obtain high common-mode and supply-voltage rejection ratios.

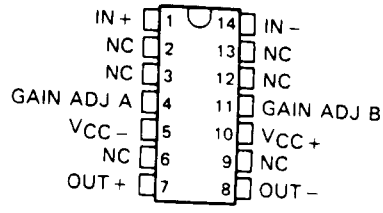
Fixed differential amplification of 400 may be selected without external components, or amplification may be adjusted from 0 to 400 by the use of a single external resistor connected between the gain-adjustment pins A and B. No external frequency-compensating components are required for any gain option.

The device is particularly useful in magnetic-tape or disc-file systems that use phase or NRZ encoding and in high-speed thin-film or plated-wire memories. Other applications include general-purpose video and pulse amplifiers.

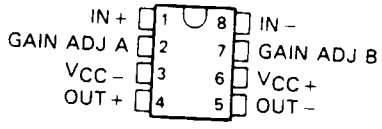
The device achieves lower equivalent noise through special processing and a new circuit layout incorporating input transistors with low base resistance.

The TL592B will be characterized for operation from 0°C to 70°C.

N DUAL-IN-LINE PACKAGE
(TOP VIEW)

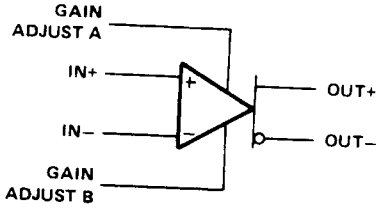


P DUAL-IN-LINE PACKAGE
(TOP VIEW)



NC – No internal connection

symbol



PRODUCT PREVIEW

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PARAMETER MEASUREMENT INFORMATION

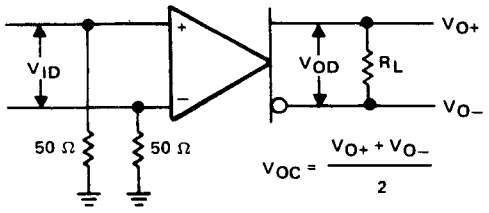

FIGURE 1

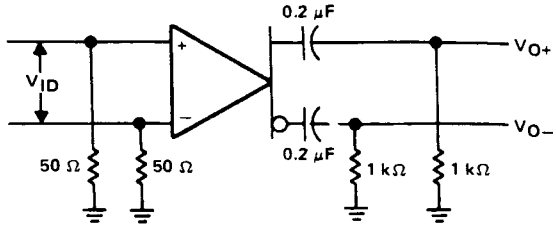

FIGURE 2

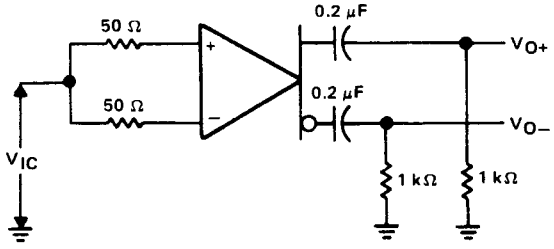

FIGURE 3

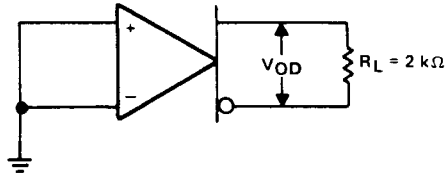

FIGURE 4